

(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 1 070 599 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

24.01.2001 Bulletin 2001/04

(51) Int Cl.⁷: B41M 3/14

(21) Application number: 99114394.2

(22) Date of filing: 22.07.1999

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

Designated Extension States:

AL LT LV MK RO SI

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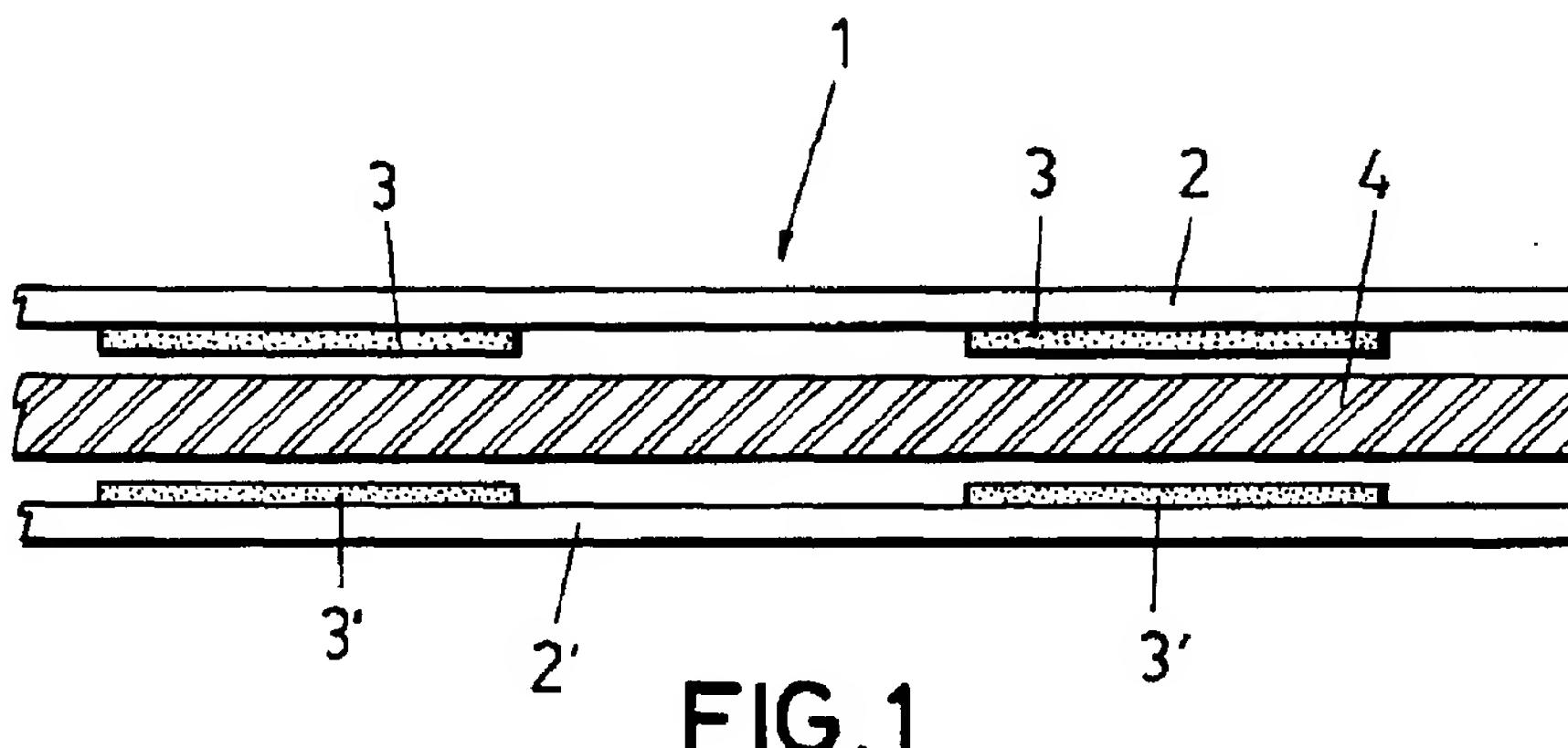
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(54) Process for printing security graphics on laminar elements

(57) Process to print security graphics on laminar elements which consists in printing images or graphics (3) and (3') on the back of two sheets of paper (2) and (2'), which remain adjacent by their inner sides bearing the graphics (3) and (3') upon an opaque, translucent or transparent sheet of a plastic, cellulose-based or synthetic nature (4), thus yielding a support (1), or otherwise incorporating the graphics (12) on the back or inner side

of a sheet of paper (11), adjacent on the face bearing the graphics (12) upon an opaque, translucent or transparent sheet of a plastic, cellulose-based or synthetic nature (13) which can also bear the graphics and which exhibits, on the opposite side, a sheet of paper (11'), similar to (11), in which no graphics are incorporated, or otherwise incorporating the graphics (12) on one or on both inner sides of the sheets of paper (11) and (11'). Eliminating in this case the central support.



Description**OBJECT OF THE INVENTION**

[0001] The present descriptive report refers to an application for a patent of invention relative to a process for printing security graphics on laminar elements, the obvious finality of which is to achieve the printing of graphics using inks of all types, incorporating the image on the inner side of two superimposed sheets adjacent to an opaque, translucent, or transparent sheet of plastic, synthetic or cellulose based or not nature, leading to the creation of a three-layered paper in which the imprint of the graphics can only be visualised using transparency, UV light or by the use of a magnetic reader, which will detect the graphics.

FIELD OF THE INVENTION

[0002] This invention finds application within the industry dedicated to the manufacture of equipment, devices and security elements applicable on laminar elements.

BACKGROUND OF THE INVENTION

[0003] The applicant is aware of the current existence of different processes specifically designed to incorporate graphics onto different laminar elements which are subsequently used in the manufacture of bank notes, admission tickets for events, deeds of property, bonds, etc., etc., which after their manufacture present a series of identification characteristics on the treated support.

[0004] In all cases known by the applicant, the processes to be used require a lengthy treatment of the supports, treatments which obviously imply a substantial increase in the cost of the support itself.

[0005] The obvious solution to this problem would be that of counting with a support which, suitably treated by a simple process, would provide a support with security characteristics of similar condition to those already known, but sensibly reducing the process or procedure of incorporation, which would result in obtaining a similar or superior level of security on the support, at a reduced price.

[0006] However, to date there is no process known by the applicant which presents all the characteristics pointed out as ideal.

DESCRIPTION OF THE INVENTION

[0007] The process to print security graphics on laminar elements proposed by the invention constitutes by itself a substantial advance within the field of the industry dedicated to the manufacture of laminar supports, provided with security characters or graphics, reducing their cost as a consequence of performing a simplified method upon them.

[0008] More specifically, the process for printing security graphics on laminar elements object of the invention, comprises performing, on the back of a sheet of paper, consecutive impressions of the graphics using

5 opaque white ink or other covering colours, having luminescent components reactive under the effect caused by UV light, under magnetic effects or having thermo-variable reagents, so that, when the sheet is observed against the light, the opaque white ink, or that made of
10 other covering colours, decreases the transparency of the overall set, giving rise to an effect similar to that of conventional watermarks, due to the fact that the impression can be carried out in woven half-tones and consequently gentle chiaroscuro effects can be obtained.

[0009] It must be pointed out that when the sheet is observed under UV light, the luminescence breaks through the upper or lower paper and appears above the set.

[0010] When the set is subjected to a certain increase 20 in temperature, such as that resulting from the exposure of the laminar element to the light of a light-bulb, the invisible impression turns visible, returning to its original state when the laminar support cools down.

[0011] The printing can also be performed with a colourless fatty ink, which will render the sheet of paper transparent, and due to the incorporation of this type of ink which has a fatty nature, luminescent components reactive to UV light, to magnetic tests or thermovariable reagents can also be incorporated, so that, when the 25 sheet is observed against the light, the fatty ink has increased the transparency of the overall set, and an effect equal to that of a watermark is achieved, as the impression can also be carried out in woven half-tones and, consequently, as in the previous case, gentle chiaroscuro effects are obtained.

[0012] It must be pointed out that when the sheet is observed under UV light, the luminescence shines through the upper or lower paper and appears above the set.

[0013] When the overall set is subjected to a certain 30 increase in temperature, such as that which can be originated by the exposure of the laminar element to the light of a light bulb, the invisible print becomes visible, returning to its original state when the laminar support cools down.

[0014] Summing up, the process implies printing upon 35 two sheets of paper which can be of different colours, characteristics and textures, regardless of whether these are arranged in rolls or in sheets, using inks, which

50 can be of the following kinds:

- Visible inks
- Invisible inks
- Opaque inks
- 55 - Transparent inks
- Magnetic inks
- Non-magnetic inks
- Thermoreactive inks

- Non-thermoreactive inks
- UV-sensitive inks
- UV-insensitive inks

[0015] The images will be positioned on the back of one of the two sheets, subsequently laminating upon a central support constituted by an opaque, translucent or transparent sheet manufactured out of a plastic, cellulose-based or synthetic material, such as polyester, vinyl, PVC, etc., etc.

[0016] As a consequence of the three sheets remaining adjacent to each other, i.e. the two sheets of paper positioned externally upon the central support (opaque, translucent or transparent) of plastic, cellulose-based or synthetic nature, said sheets of paper bearing the graphics or images on their internal faces, being said graphics attached to the external faces of the central support, it is achieved that the impressions performed, i.e. the graphics, can only be observed by transparency employing UV light, or be detected by using a magnetic reader.

[0017] Optionally, the process permits the incorporation of security graphics, giving rise to a laminar support, constituted in a similar manner as the one described earlier, eliminating the incorporation of graphics on the inner side of one of the two laminar elements manufactured in paper, i.e. only one of the paper laminar elements will bear graphics or impressions on its inner side, said graphics being adjacent to the central support, the latter in turn bearing on its opposite side the same paper laminar element.

[0018] Another solution permits the incorporation of security graphics, both on the inner sides of the laminar elements as well as on the outer side of the central support.

[0019] Finally, a last solution permits the impression of security graphics on the internal faces of the paper sheets, eliminating in this case the central support, thus resulting in the two sheets of paper being adjacent to each other. The graphics may be on one or on both sheets of paper.

DESCRIPTION OF THE DRAWINGS

[0020] In order to complement the description which is being made, and with the object of aiding to a better understanding of the characteristics of the invention, the present descriptive report is accompanied, as an integral part of the same, by two sheets of drawings which, with an illustrative, non-limiting character, represent the following:

[0021] Figure 1.- Corresponds to a side elevational view of a laminar support obtained by the process for printing security graphics on laminar elements object of the invention, which represents the option in which both sheets of paper are printed on their inner faces and are subsequently laminated on a central support.

[0022] Figure 2.- Shows a similar view to that repre-

sented in figure number 1, depicting a second embodiment of the invention in which the security graphics are only incorporated on one of the laminar elements.

[0023] Figure 3.- Shows a similar view of the option in which security graphics can be printed both on the internal faces of the laminar elements as well as on the outer face of the central support.

[0024] Figure 4, represents the option in which the central support disappears, being the security graphics only printed on the internal faces of the laminar elements.

PREFERRED EMBODIMENTS OF THE INVENTION

[0025] Under the light of the figures, it can be seen how the process to print security graphics on laminar elements proposed by the invention consists in obtaining, in a first embodiment (1), a laminar support configured from two sheets of paper (2) and (2'), between which a central support (opaque, translucent or transparent) (4) of plastic, cellulose-based or synthetic material may or may not be incorporated.

[0026] In a first embodiment, as depicted in figure 1, regardless of whether the two laminar elements (2) and (2') are configured in rolls or in sheets, the internal face of each of the these laminar elements (2) and (2') is imprinted with the graphics, using visible, invisible, opaque, transparent, magnetic, non-magnetic, thermo-reactive, non-thermoreactive, light-sensitive or light-insensitive inks, and considering that the images so configured, or graphics (3) and (3') are positioned on their internal faces, they are superimposed adjacent to the central support (opaque, transparent or translucent) of a plastic, synthetic or cellulose-based nature, consequently achieving the creation of a three-layered paper in which the impressions (3) and (3') performed on the external sheets (2) and (2') can only be visualised by transparency, by UV light, or be detected by means of a magnetic reader.

[0027] In a second embodiment, as shown in figure 2, a support (10) is obtained, configured as a three-layered paper, in which, the impression performed (12) is carried out on the back or inner face of a sheet of paper (11) placing the sheet of paper (11) at the side bearing the graphics or images (12) adjacent to and upon a central support (opaque, translucent or transparent) (13), in which, on the opposite face, it will be bound to another sheet of paper (11'), which bears no graphics on its faces, external or internal.

[0028] In a third embodiment, as shown in figure 3, a support (10) is obtained, configured as a three-layered paper, in which, the impression performed (12) is carried out on the back or inner face of a sheet of paper (11) placing the sheet of paper (11) at the side bearing the graphics or images (12) adjacent to and upon a central support which is opaque, translucent or transparent (13), on which graphics are also printed (12), which, on the opposite face, will be bound to another sheet of pa-

per (11'), which bears no graphics on its faces, external or internal.

[0029] In a fourth embodiment, as shown in figure 4, a support (10) is obtained, configured as a two-layered paper, in which, the impression performed (12) is carried out on the inner face of one or of the two sheets of paper (11) and (11'), eliminating the central support.

[0030] It is considered unnecessary to extend this description any further for any expert in the matter to understand the scope of the invention and the advantages derived from it.

[0031] The materials, form, shape and arrangement of the elements are susceptible of variation, as long as this does not alter the scope of the invention.

[0032] The terms in which this report has been described are always to be taken in the widest, non-limiting sense.

per (11') is bound.

4. Process to print security graphics on laminar elements, according to the previous claims, characterised in that, optionally, the process allows to obtain a support (10) in which the graphics (12) can be carried out on one or on both internal faces of sheets of paper (11) and (11'), and in which central sheet disappears.
5. Process to print security graphics on laminar elements, according to the previous claims, characterised in that the inks constituting the graphics (3), (3') and (12) can be visible, invisible, opaque or transparent, magnetic or not, thermoreactive or not, or sensitive to UV light or not.

Claims

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1. Process to print security graphics on laminar elements, of those destined for obtaining laminar supports which are later used for the impression of paper money notes, admission tickets for events, deeds of property, etc., etc., characterised in that it is constituted starting from the impression of graphics (3) and (3') on the back or inner face of sheets of paper (2) and (2'), obtained from rolls or in sheets, being the printing of the graphics (3) and (3') performed by the use of inks, incorporating between the sheets of paper (2) and (2'), an opaque, translucent or transparent sheet (4) of a plastic, cellulose-based or synthetic nature, so that the three sheets (2), (4) and (2') subsequently remain bound, with the graphics (3) and (3') staying adjacent to the external faces of the central support (4).

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2. Process to print security graphics on laminar elements, according to the first claim, characterised in that, optionally, the process allows to obtain a support (10) in which the graphics (12) carried out on the inner face of a sheet of paper (11), remain adjacent to one of the faces of an opaque, translucent or transparent central support, configured as a sheet of plastic, cellulose-based or synthetic nature (13), upon the opposite side of which a sheet of paper (11') is bound.

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3. Process to print security graphics on laminar elements, according to the previous claims, characterised in that, optionally, the process allows to obtain a support (10) in which the graphics (12) can be carried out on the inner face of a sheet of paper (11) and/or on the central support (opaque, translucent or transparent) configured as an intermediate sheet of a plastic, cellulose-based or synthetic nature (13), upon the opposite side of which a sheet of pa-

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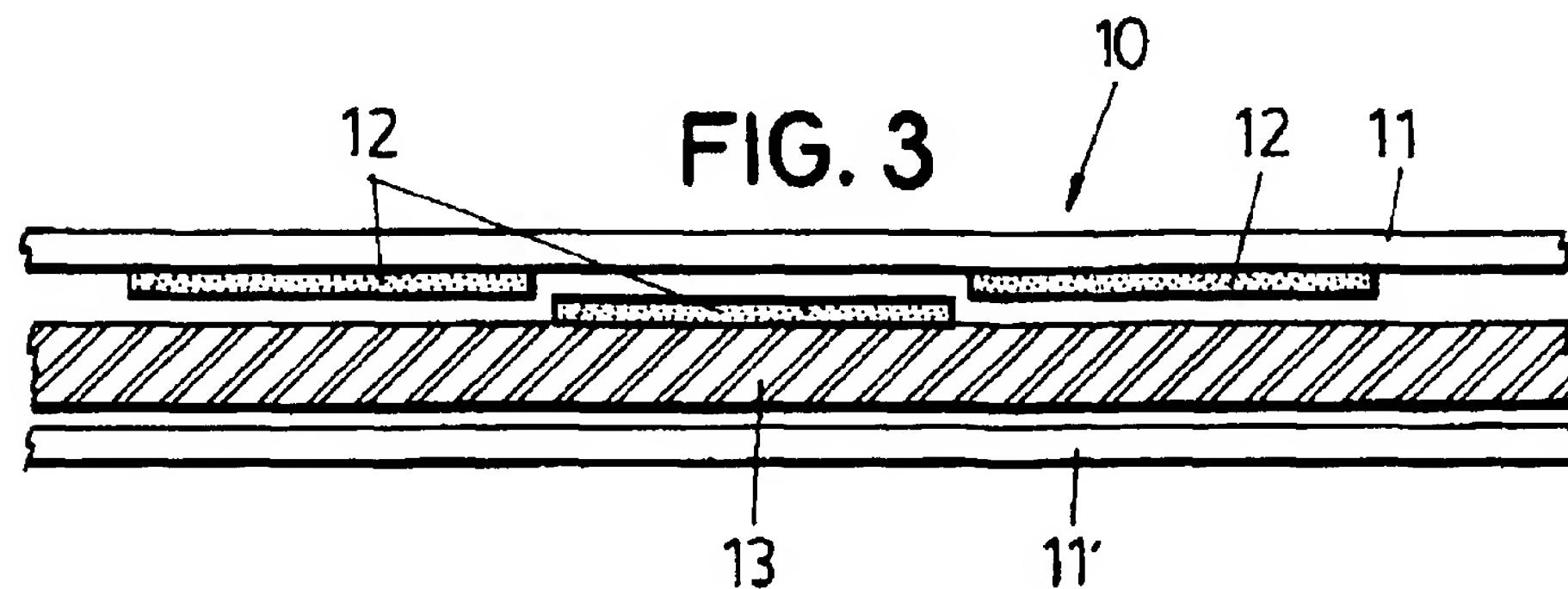
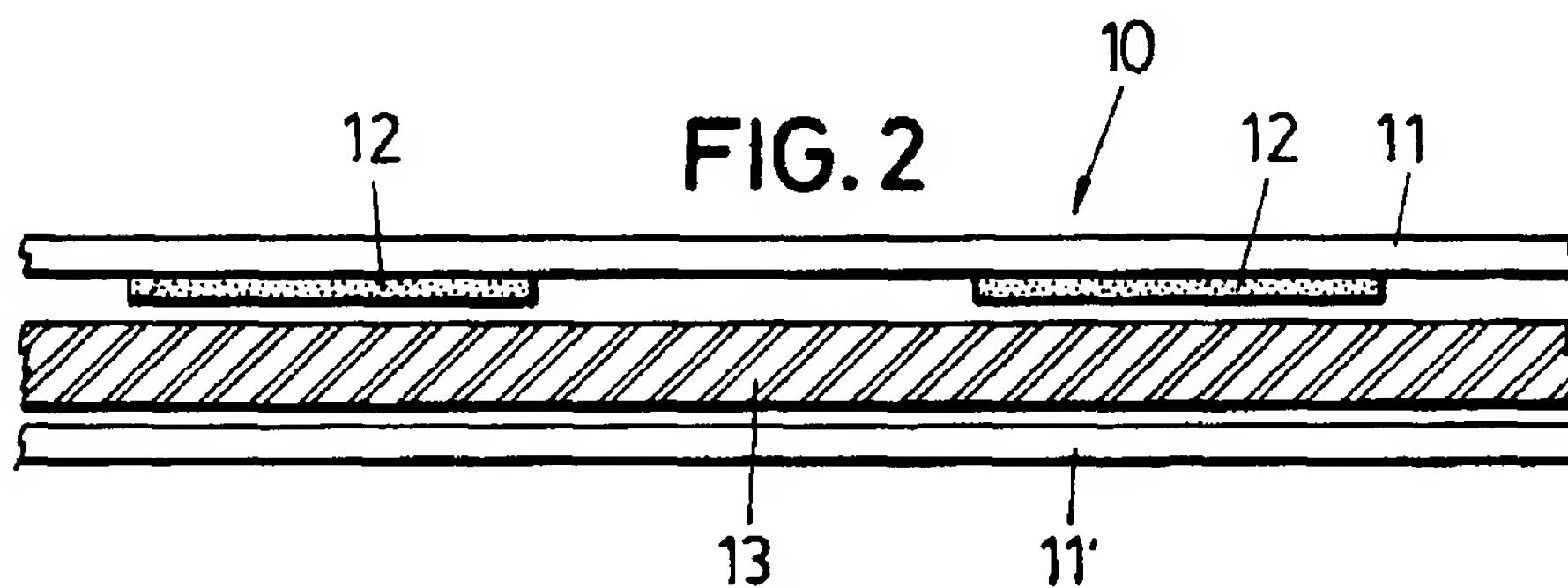
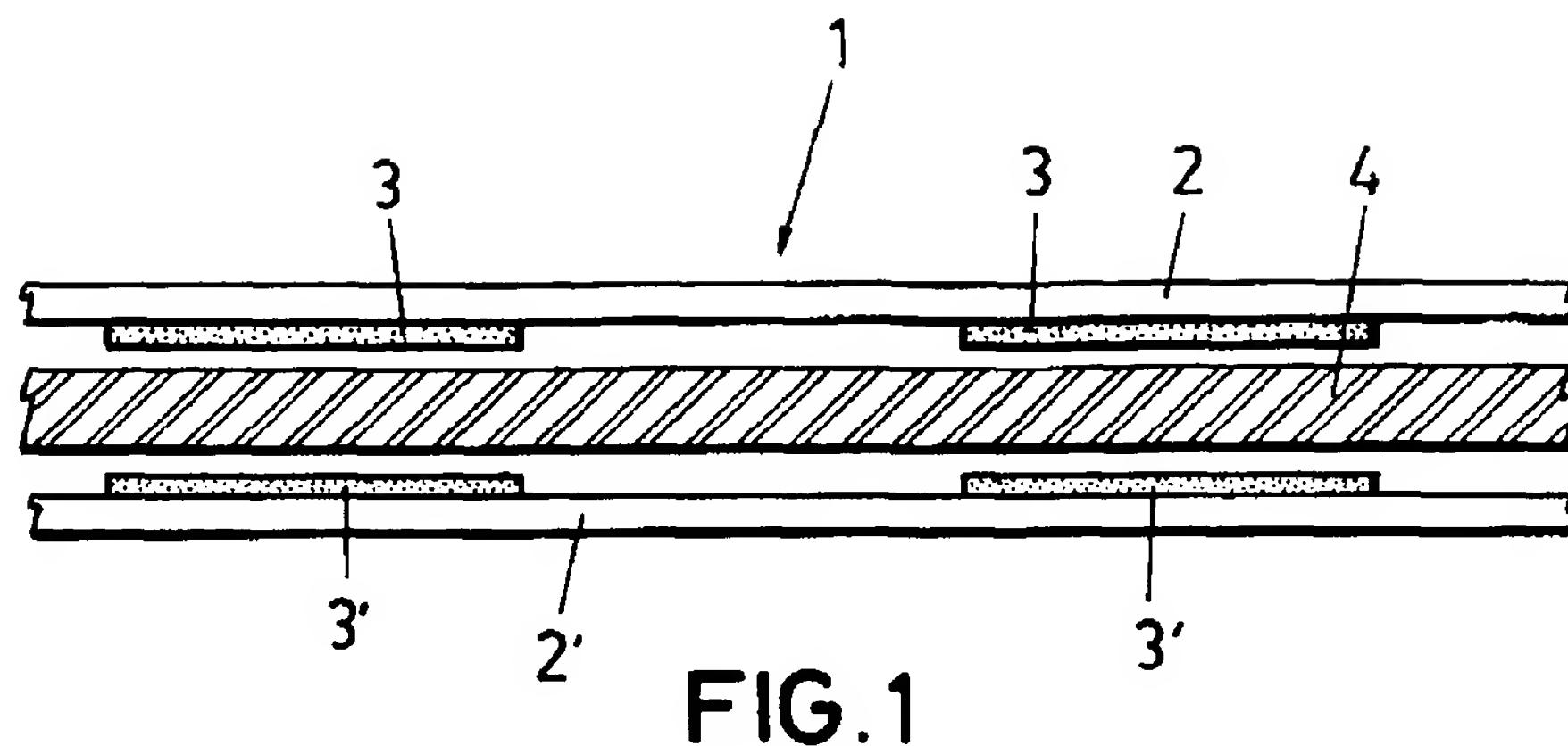
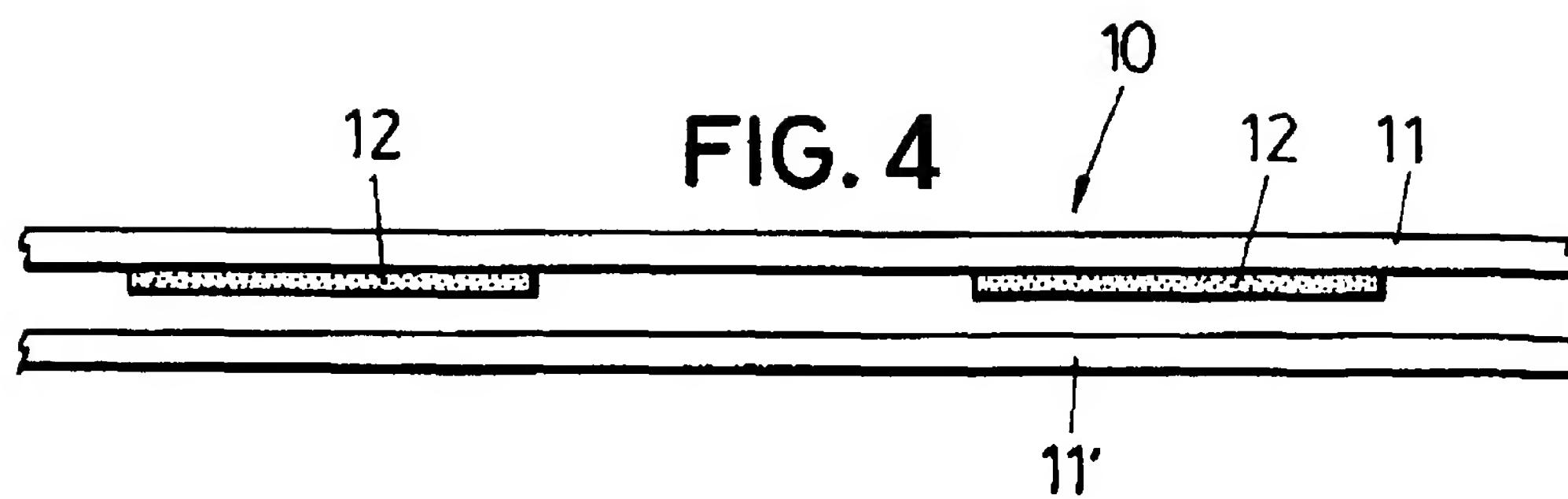


FIG. 4





DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
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Y	EP 0 453 131 A (JAMES RIVER CORP) 23 October 1991 (1991-10-23) * column 3, line 45 - column 4, line 32 * * column 5, line 34 - column 7, line 28 * * column 11, line 26 - line 32; figure 1 * ----	1-5	
Y	EP 0 628 408 A (ANDRIC DRAGISA ;STOJANOVIC BORISLAV (YU)) 14 December 1994 (1994-12-14) * page 4, line 41 - page 5, line 5; claims 1-11; figures 1-4 * ----	1-5	
Y	EP 0 666 182 A (NACIONAL MONEDA TIMBRE) 9 August 1995 (1995-08-09) * column 4, line 3 - column 5, line 4 * ----	1-5	
Y	US 5 393 099 A (D'AMATO SALVATORE F) 28 February 1995 (1995-02-28) * column 2, line 13 - column 3, line 18 * -----	1-5	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B41M B42D
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	6 December 1999	Balsters, E	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent document(s) cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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